

## Behavioral Responses of Bighorn Sheep Following a Large-Scale Wildfire

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**ABSTRACT:** Rapid global climate change is expected to increase the frequency and severity of major disturbance events. Resilience of species to such changes will depend upon their ability to adjust behavior in response to changes in resource availability. We explored behavioral responses of female bighorn sheep (*Ovis canadensis*) to the Lick Creek Fire in southeastern Washington, a high-intensity wildfire that burned ~80,000 acres from July 7–10, 2021. We predicted that bighorn sheep would be displaced by the fire and would alter movement and space-use patterns in response to the drastic short-term reduction in forage availability. We used GPS data from 18 bighorn ewes to quantify patterns of home-range size and fidelity, movement, and habitat selection during the 25 days before versus 25 days immediately after the fire. Despite a dramatic reduction in forage availability post-fire, bighorn sheep were extremely faithful to their pre-fire home ranges. However, we observed shifts in movement patterns post-fire that ostensibly reflected depletion of forage resources. Although bighorn sheep selected areas closer to escape terrain before and after the fire, they were more likely to venture farther from escape terrain to access forage (indexed by NDVI) after the fire. Moreover, sheep selected for high NDVI after the fire, whereas they avoided areas of high NDVI before the fire. These results suggest that bighorn sheep faced a tradeoff between escape terrain and forage pre-fire, but that either (1) the magnitude of that tradeoff attenuated after the fire, or (2) the nature of the tradeoff was altered by the fire, forcing bighorn sheep to use areas farther from escape terrain to find food. Our results also demonstrate that responses of large herbivores like bighorn sheep to disturbance are complex and may simultaneously be plastic in one dimension (e.g., movement patterns) and less flexible in another (e.g., home-range fidelity).

*Biennial Symposium of the Northern Wild Sheep and Goat Council 23:50; 2022*

**KEY WORDS:** bighorn sheep, climate effects, habitat selection, Washington, wildfire.